



Military Traffic Management Command

Transportation Engineering Agency



PORTSIM

Argonne National Laboratory

Virginia Modeling Analysis and Simulation Center

GLOBAL DEFENSE TRANSPORTATION ENGINE

CONUS INFRASTRUCTURE:

Port and Installation analyses to support strategic mobility

TRANS PROGRAMS FOR

NATIONAL DEFENSE:

Administer Executive Agent role for highway, rail & ports

CINC SUPPORT:

PACOM/USFK/EUCOM theater deployment modeling, simulation, analysis, port capability & exercise support

CINC SUPPORT:

ACOM deployment M&S to support Unified Endeavor exercises

FORCE MODERNIZATION:

Analysis of conceptual and new weapon systems, Army XXI & AAN forces

HOST NATION INFRASTRUCTURE:

Port, road & rail network analysis to support operations other than war

PROGRAMMATIC (MRS/TAA):

Analysis of strategic and tactical lift assets and enabling units (current/future)

CINC SUPPORT:

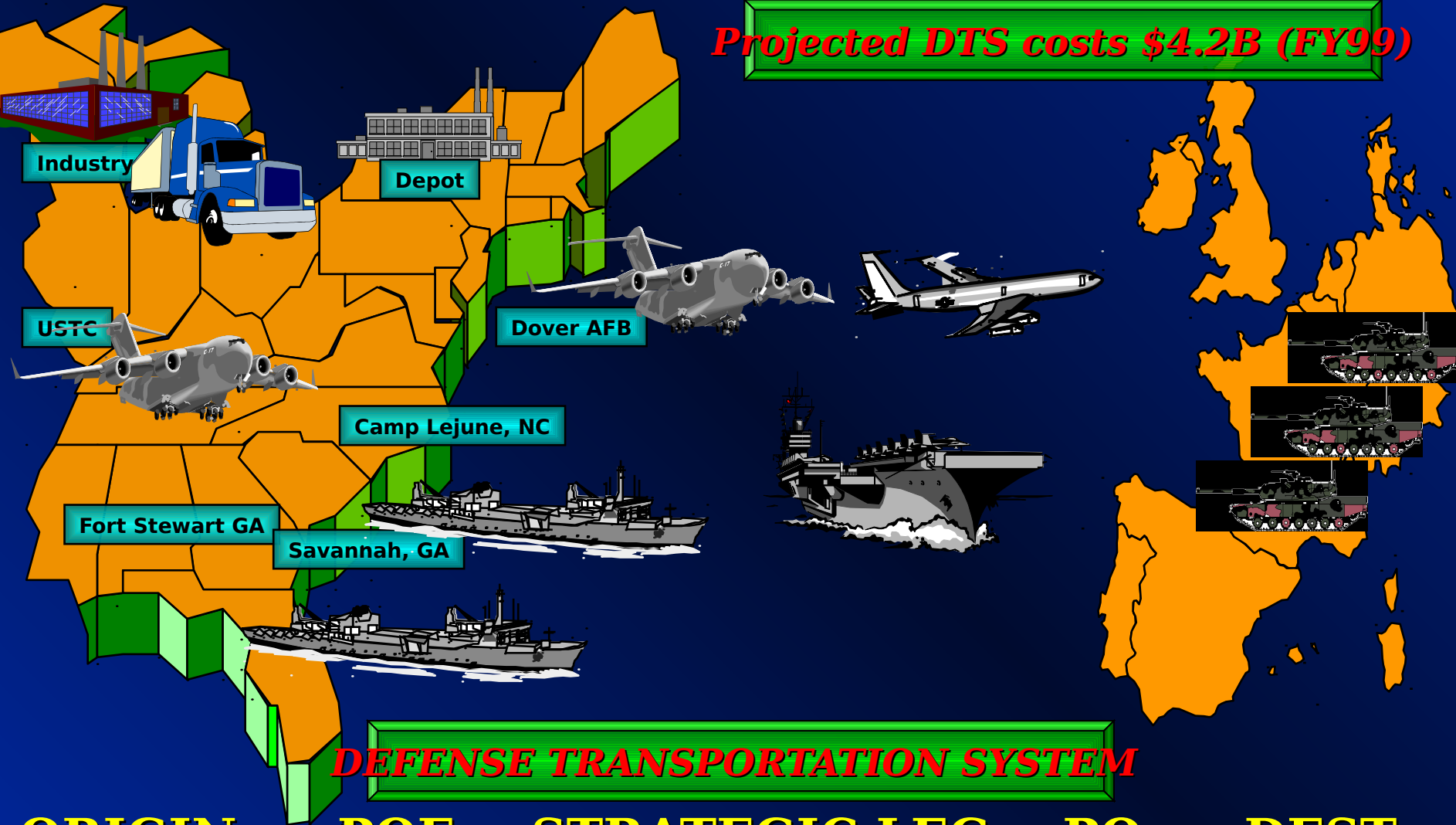
CENTCOM theater deployment modeling, simulation, analyses, port capability & exercise support

END TO END MODELING AND SIMULATION CAPABILITY

TARGET-TRANSCAP-ELIST-PORTSIM-MIDAS/IFAST-PORTSIM-ELIST

DTS

Projected DTS costs \$4.2B (FY99)



ORIGIN

POE

STRATEGIC LEG

PO

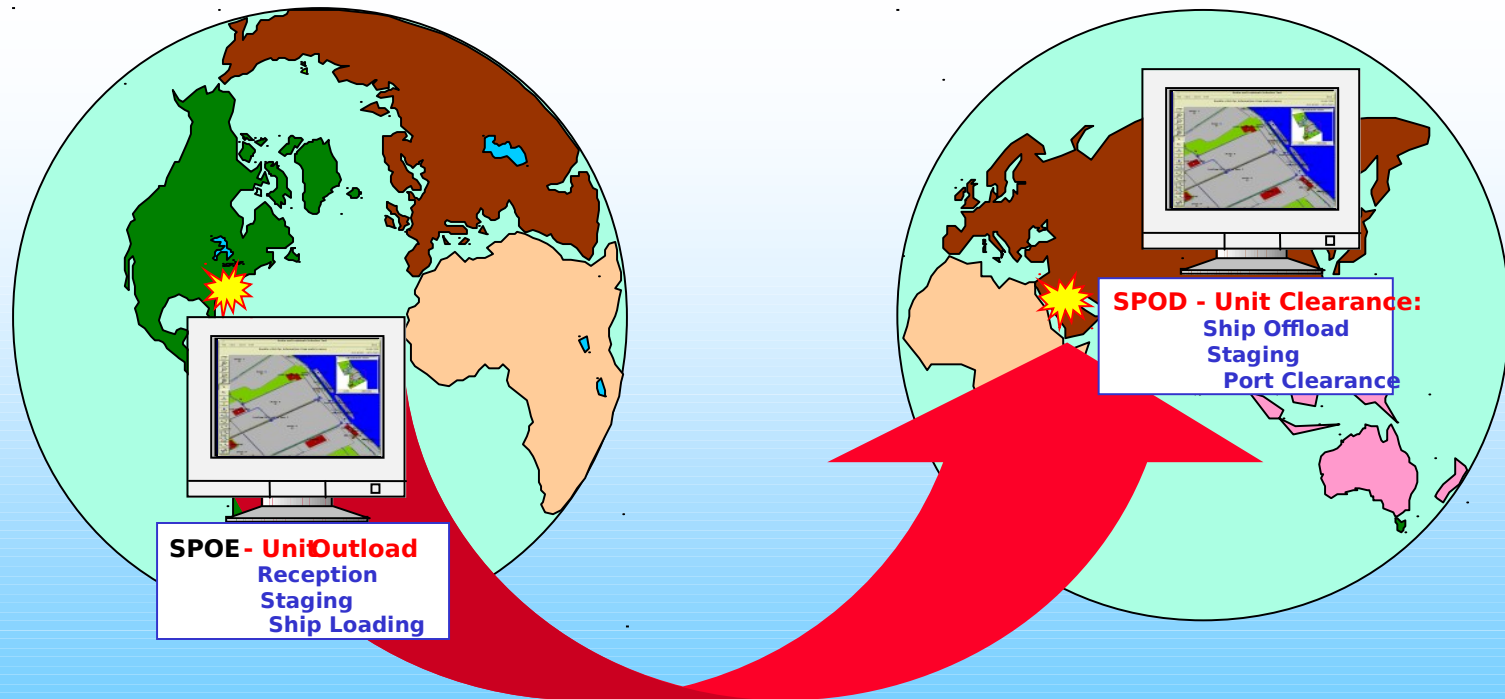
DEST.

D

FORCE PROJECTION MODEL



PORT SIMULATION MODEL



PROGRAM DESIGN

✓ **Time-stepped, Discrete Event, Simulation of Port Operations:**

- Determines port throughput capability
- Identifies constraints
- Determines port unit clearance profiles
- Analyzes at “eaches” level of detail
- Scenario specific
- JLOTS via CITM (austere port module)
- Dynamic
- Future: 2 and 3-D animation

PROGRAM DESCRIPTION

✓ Objectives:

- Object-oriented port simulation addressing military port mobility issues
- Ability to simulate military units through a specified port with individual cargo items represented
- Port throughput and utilization statistics for all port resources (gates, staging, berths, inspectors, MHE, etc.)
- Ability to track cargo from arrival times at gates or end ramps to the time it is loaded aboard ship
- Dynamic animation - identifies bottlenecks and facilitates the playing of what-if scenarios to maximize throughput

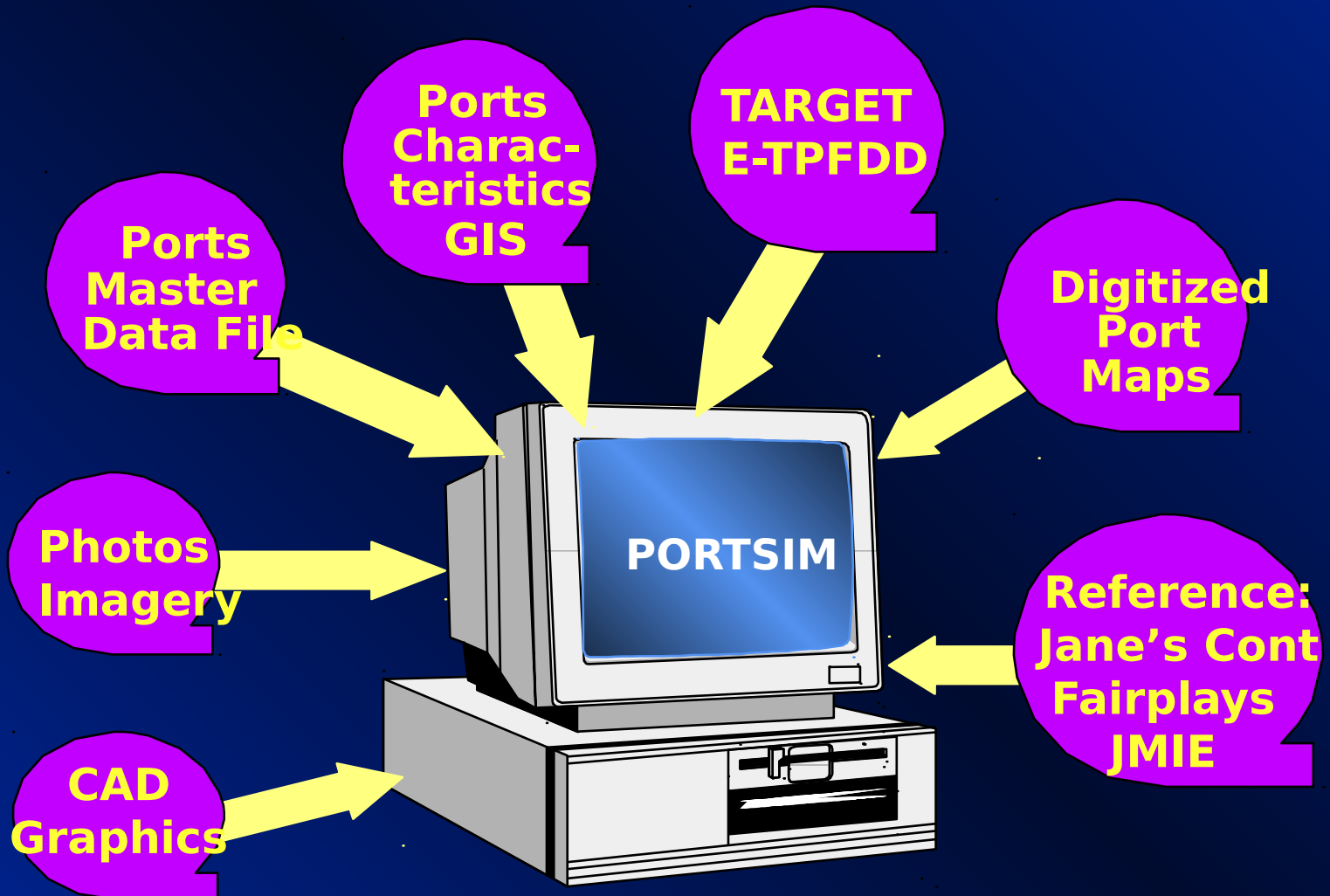
DEPLOYMENT ISSUES

✓ Designed To Answer The Following Deployment Questions:

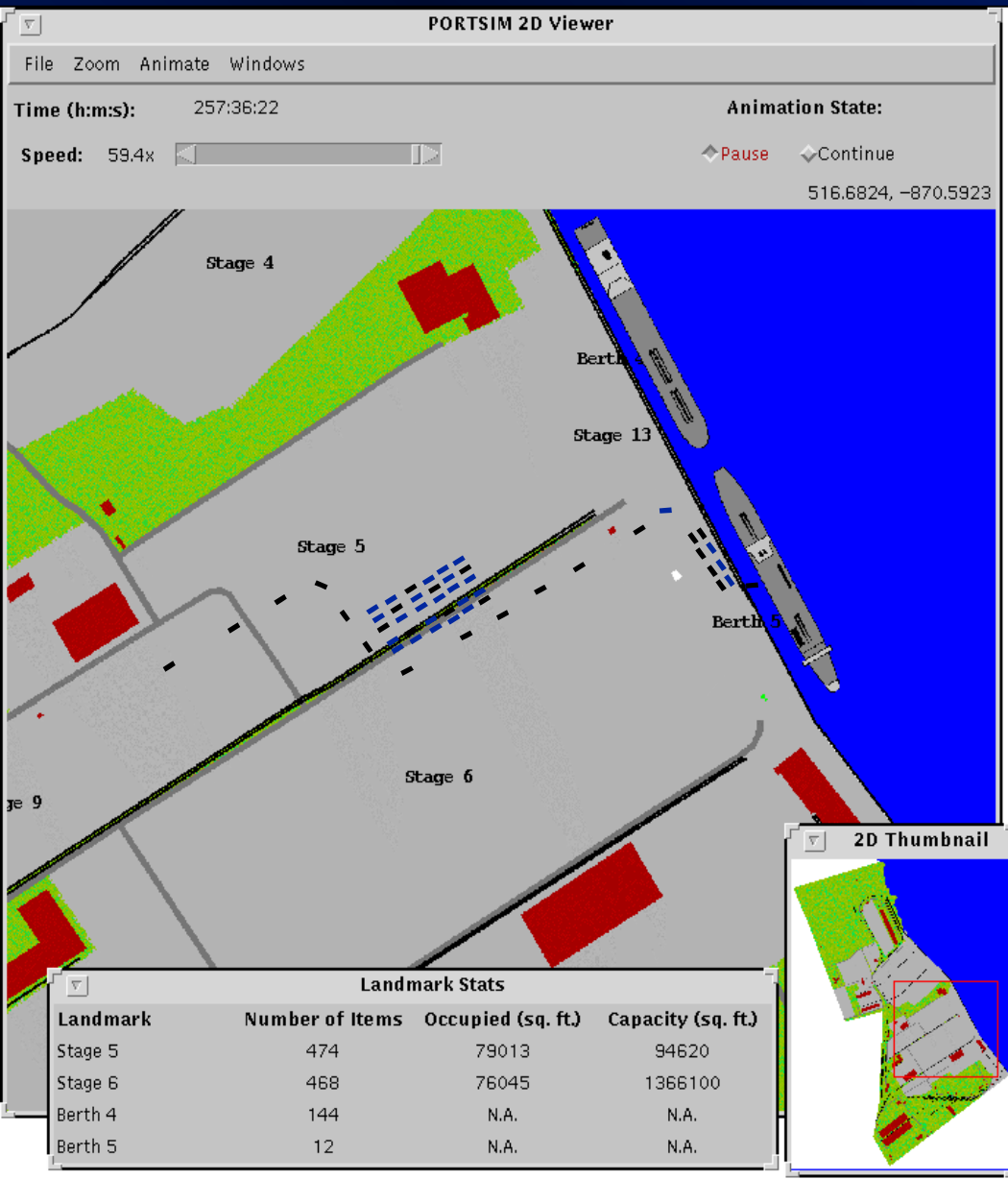
- How long does it take a force to move through a port (port unit clearance profiles)?
- What and where are the bottlenecks within a port?
- What part of a port is needed based on the force moving through it?
- Why are the forces not closed by the required time and what are current force locations/status within a port?
- What is the measured impact of JLOTS on force projection and the DTS?

DATA

✓ Various Levels Of Detail:

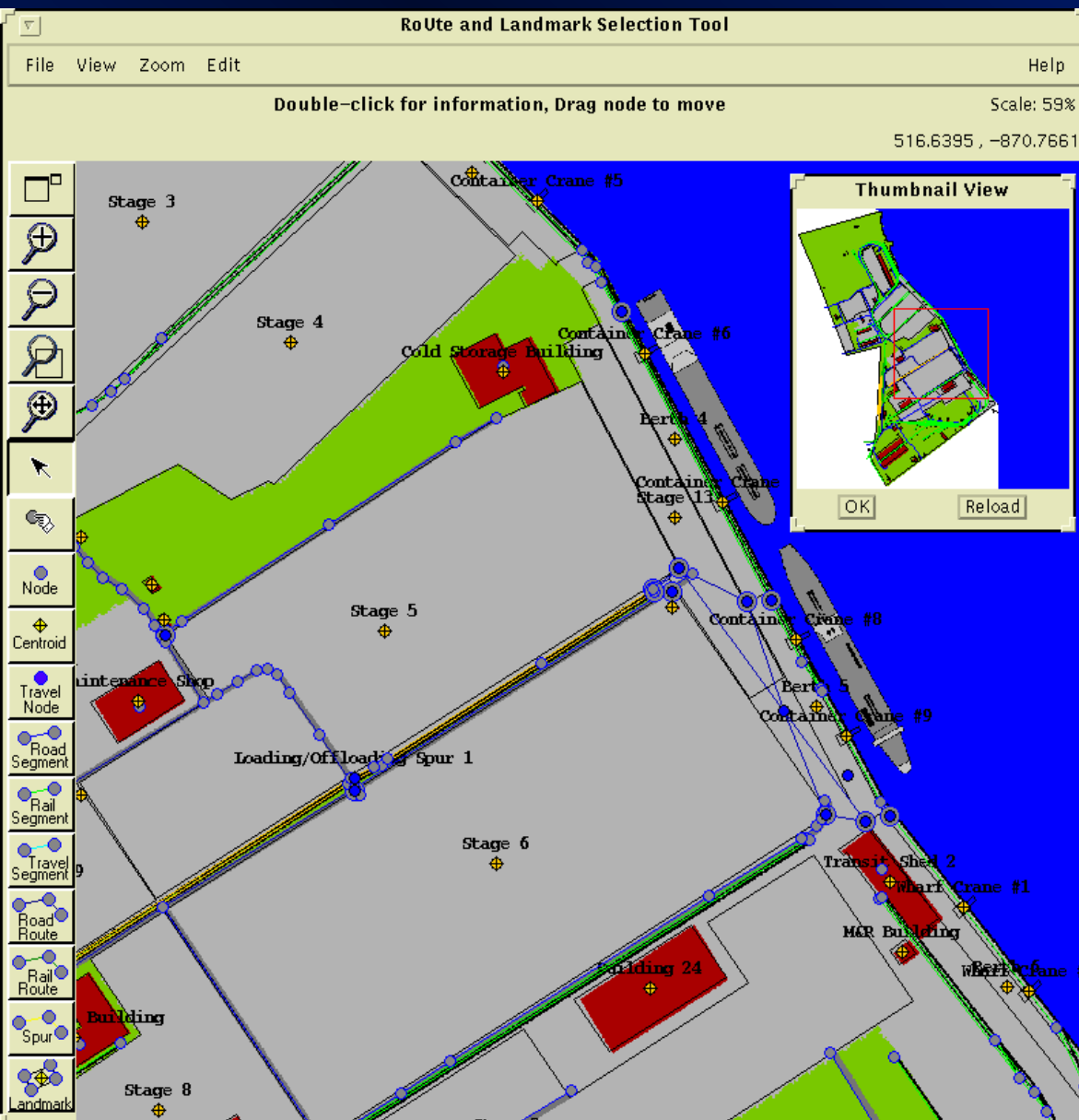


ANIMATION



- ✓ **Current: port event history file passed from PORTSIM to 2D animation viewer**
- ✓ **Future: dynamic**
- ✓ **Animation overlaid on infrastructure rendering**
- ✓ **Common infrastructure objects utilized (RULST)**
- ✓ **Developed in Java: zoom, pan adjustable speed**

RULST



✓ Infrastructure Data:

- Road and rail segments: routes
- Landmarks: berths, gates, staging areas, interchange yards, buildings, ...

✓ All Infrastructure Element Modeled at High Level of Detail

✓ RULST Tool:

- User dynamically creates road and rail infrastructure
- PORTSIM utilizes infrastructure data to play “what if” scenarios

VALUE ADDED



Gulf War Problems:

- ✓ Deployment surges and sequencing problems
- ✓ Planning and replanning requirement changes
 - Unit footprint growth, ammunition demand
- ✓ Over-ordering because of lack of visibility in process

VALUE ADDED

- ✓ **Port Workload Studies** (Cost Avoidance - Contracting)
- ✓ **Ports For National Defense** (Improved Business Process/Decision Making)
- ✓ **TPFDD Analysis** (Cost/Time Avoidance)
- ✓ **CINC Analyses** (Cost/Time Avoidance - Host Nation Support/Infrastructure)
- ✓ **Infrastructure Trade-off Investment Analysis** (Cost Benefit)
- ✓ **Portable, Stand-alone, Field Capability** (Cost Avoidance - Hardware/Support)
- ✓ **Virtual SEDRE/Deployment** (Cost Avoidance)
- ✓ **Training Port Operators** (Cost Avoidance)

EXPECTED CUSTOMERS

Transportation Feasibility:
• TRANSCOM
• CINC
• JCS
• DA staff
• Required Port Cmds
• J2B G2P
• US Army COE WES
• MEPS

✓ Programmatic Analysis

- TRANSCOM
- DA staff
- TRADOC
- OSD
- MTMC DSC
- JWARS

✓ Training:

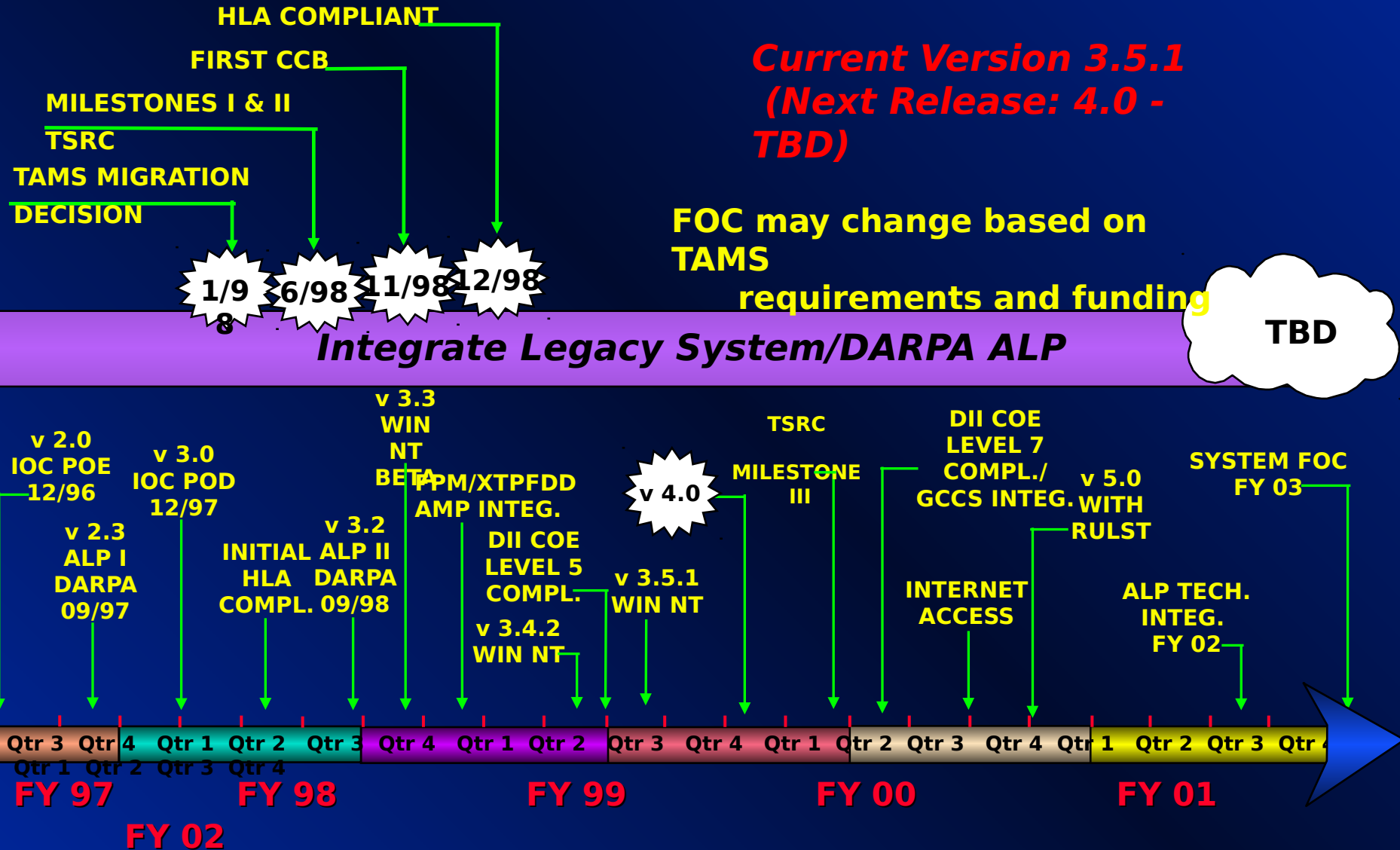
- Port Operators
- Virtual SEDRE
- T-School
- Merchant Marine

Academy

✓ Wargaming:

- CINCs
- TRADOC
- JTASC
- JSIMS

INTEGRATED SCHEDULE



INITIAL FIELDING PLAN

*Version 4.0 Baseline FOC Incremental
Fielding*



**CONTINGENT
ON
FUNDING!**

Phase 1	Phase 2	Phase 3
MTMC CONUS (10 Sites)	Navy (8 Sites)	CINCs (6 Sites)
MTMC Pacific (4 Sites)	Marine Corps (5 Sites)	DA/JCS (3 Sites)
MTMC Europe (9 Sites)	MARAD (2 Sites)	OSD (2 Sites)
FORSCOM (25 Sites)	WES (1 Sites)	Training Loc. (5 Sites)
		Wargaming Loc. (5 Sites)
2nd Qtr FY01 Qtr FY01	3rd Qtr FY01	4th

FUTURE

✓ **Future Capability:**

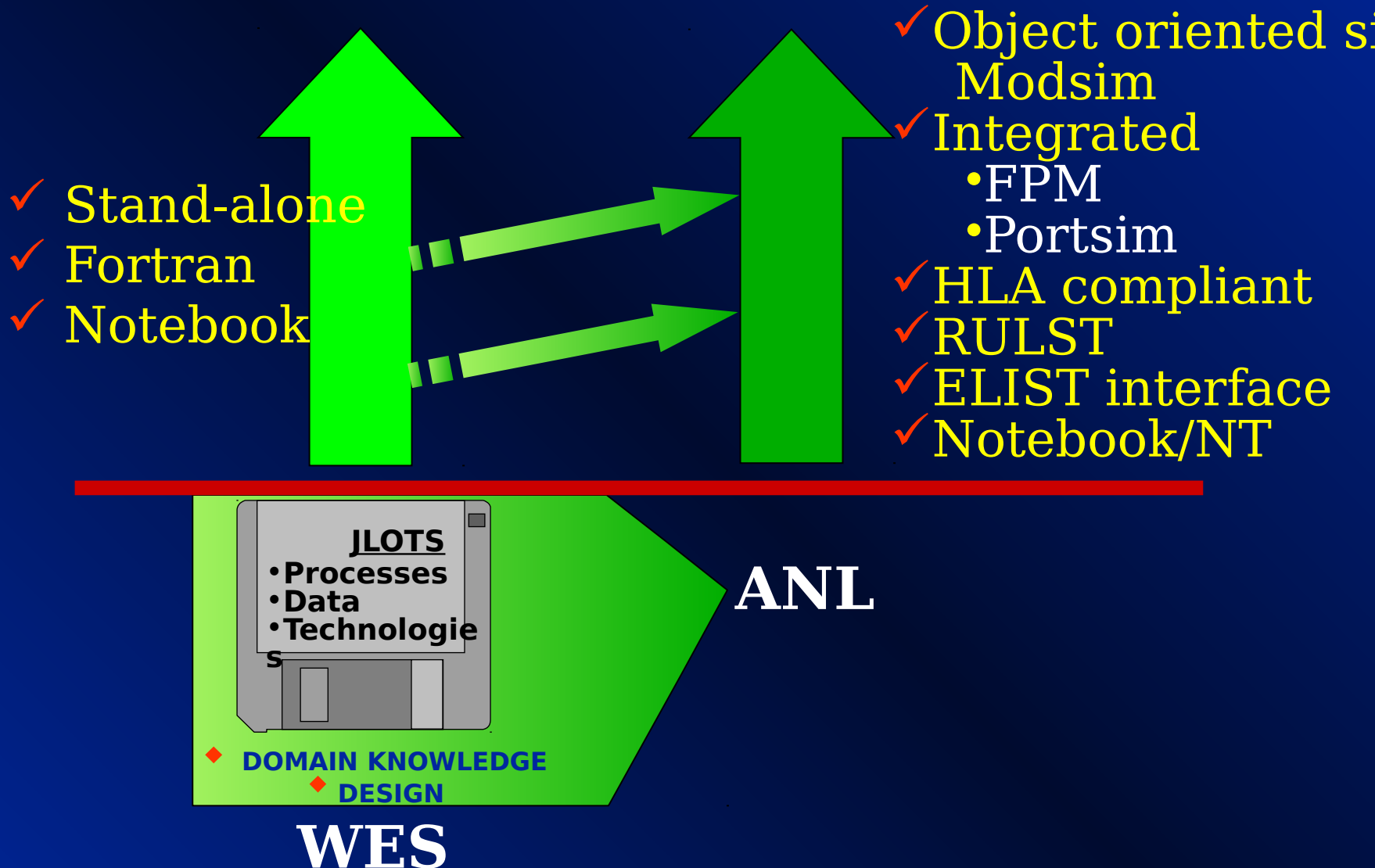
- Weapons of Mass Destruction (WMD)
- Multiple port processing
- Ammunition ports

CITM USES

- ✓ **Assess Impact of JLOTS on Force Projection and the DTS**
- ✓ **Evaluate Emerging JLOTS Oriented Technologies**
- ✓ **Link Beach Staging Areas and Infrastructure**
- ✓ **Provide Site Selection**

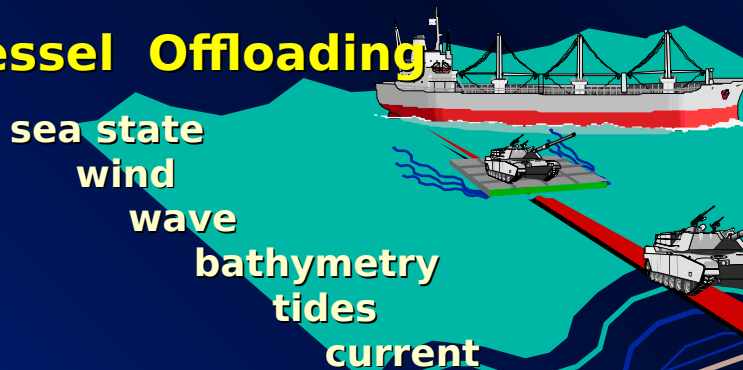


CITM DEVELOPMENT



CITM DESCRIPTION

• Vessel Offloading



• Shore-Side Discharge

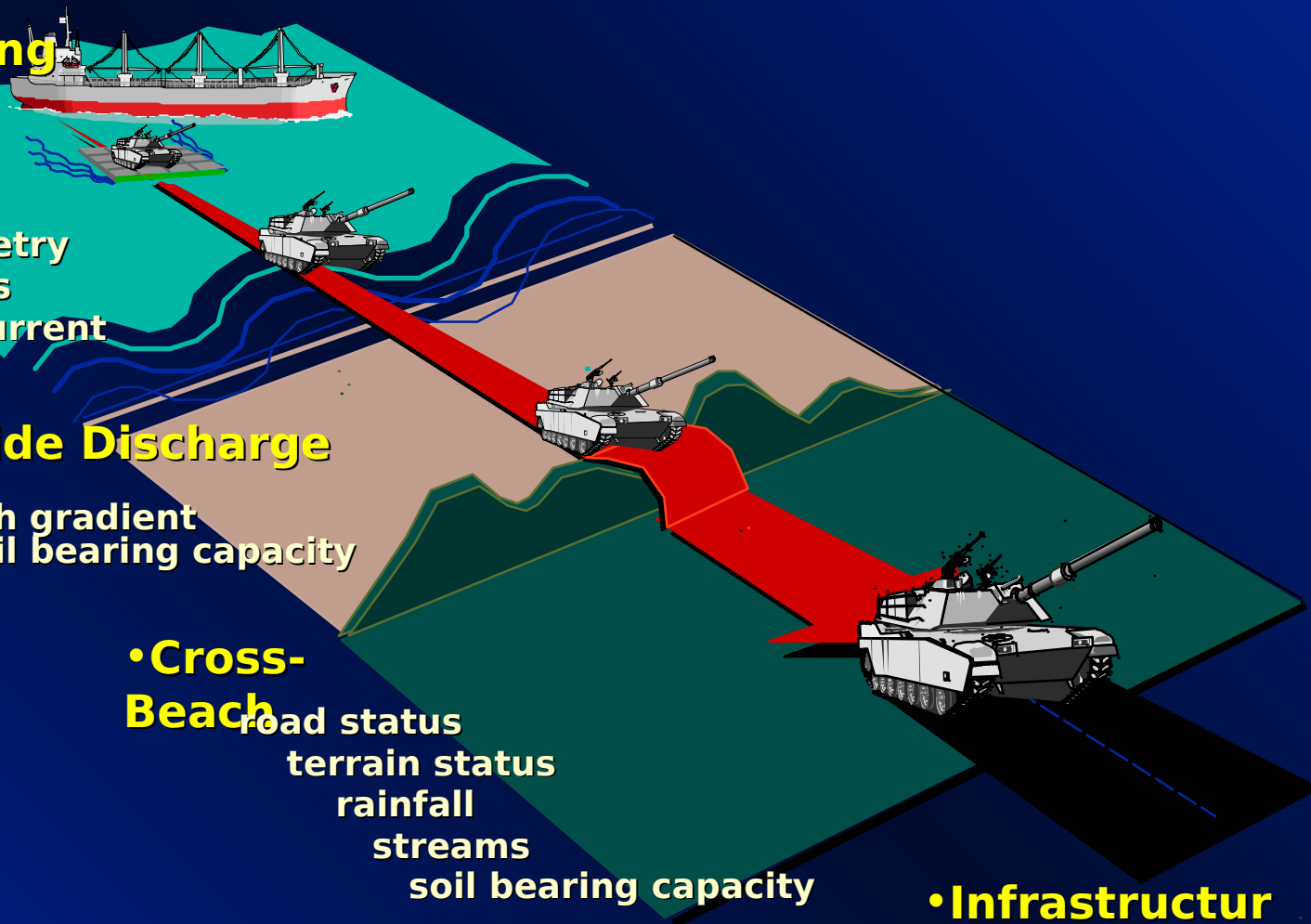
beach gradient
soil bearing capacity

• Cross-Beach

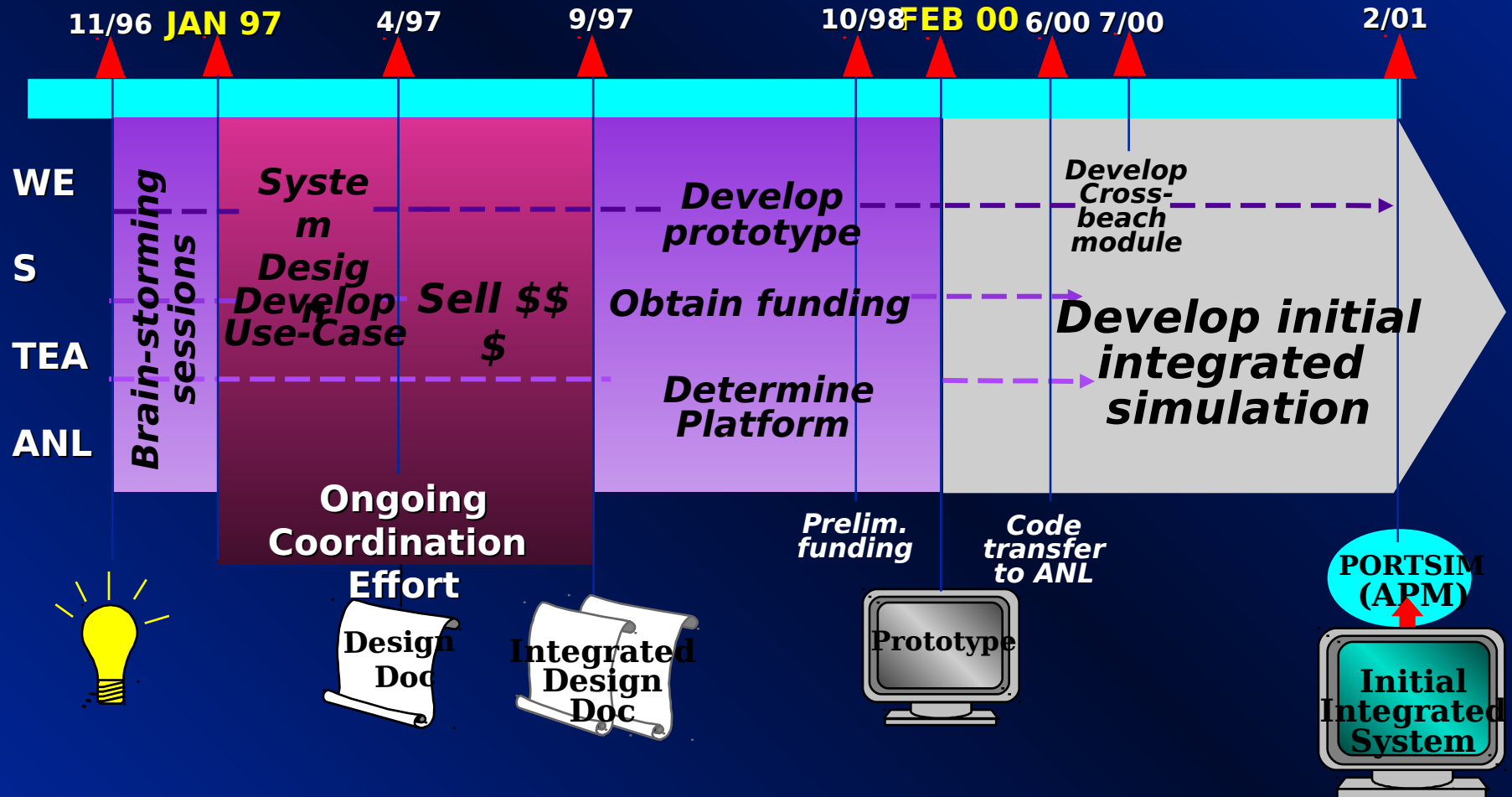
road status
terrain status
rainfall
streams
soil bearing capacity

• Infrastructure

Node



CITM DEVELOPMENT TIMELINE



Transportation Infrastructure Network Builder (TINet)



NIMA

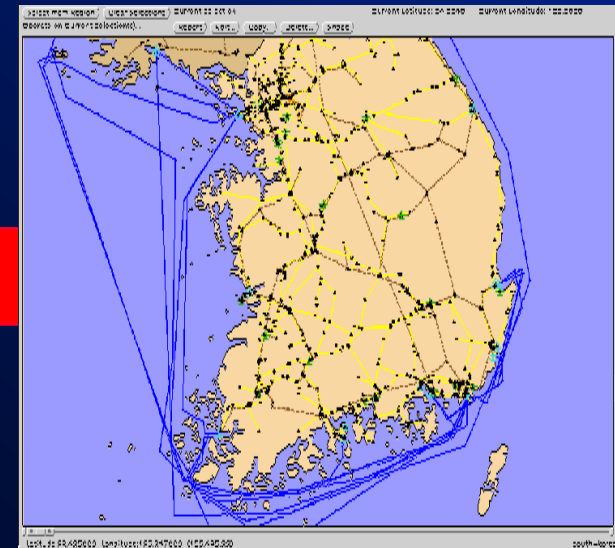
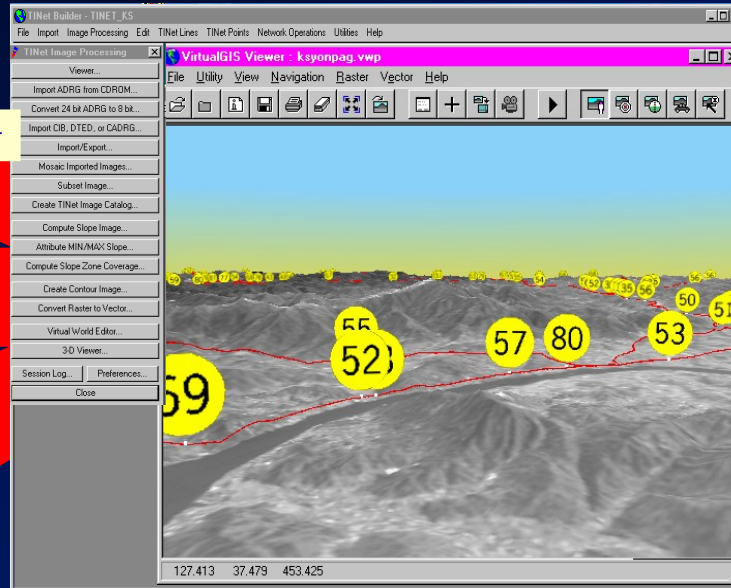
Elevation Geometry Imagery



Feature Attributes



Feature Attributes



All Source

GIS Networks for OCONUS
ELIST





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MIL](http://WWWTEA.MTMC.ARMY.SMIL.MIL)